

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 July 2004 (22.07.2004)

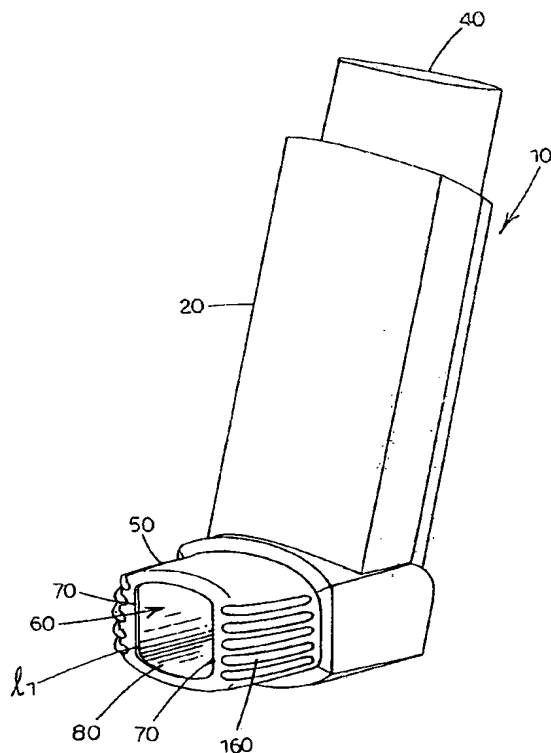
PCT

(10) International Publication Number
WO 2004/060260 A2

- (51) International Patent Classification⁷: **A61J**
- (21) International Application Number:
PCT/US2003/038483
- (22) International Filing Date: 4 December 2003 (04.12.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/434,517 18 December 2002 (18.12.2002) US
- (71) Applicant (for all designated States except US): **GLAXO GROUP LIMITED** [GB/GB]; Glaxo Wellcome House, Berkeley Avenue, Greenford, Middlesex UB6 0NN (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **KING, Michael, L.** [US/US]; 3229 Lochinvar Drive, Durham, NC 27705 (US).
- (74) Agents: **LEVY, David, J.** et al.; GlaxoSmithKline, Corporate Intellectual Property Department, Five Moore Drive, P.O. Box 13398, Research Triangle Park, NC 27709 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: DRUG DELIVERY SYSTEM WITH VENTED MOUTHPIECE



(57) Abstract: An oral inhaler suitable for delivering a pharmaceutical formulation to a patient comprises a container having the pharmaceutical formulation comprising at least one medicament present therein, and a mouthpiece configured for oral engagement with a patient and in communication with the container, the mouthpiece having an inner surface and an outer surface; wherein the outer surface of the mouthpiece contains at least one longitudinally-extending disuniformity such that when the patient orally engages the mouthpiece at least one void space is created between the outer surface of the mouthpiece and the oral cavity of the patient so as to provide an air flow channel through the at least one void space to facilitate intake of the at least one medicament by the patient.

WO 2004/060260 A2